

Sample Questions

Don't use calculators.

1. Consider the matrix $A = \begin{pmatrix} 3 & -5 & 7 \\ 0 & 1 & -4 \end{pmatrix}$.
 - (a) How many rows does A have?
 - (b) How many columns does A have?
 - (c) What is the order of A ?
 - (d) Find the matrix $-A$.
 - (e) Find the transpose A^T of A .
2. Consider the matrix $B = \begin{pmatrix} 3 & -5 \\ 0 & 1 \end{pmatrix}$.
 - (a) What is the order of B ?
 - (b) Find the transpose B^T of B .
 - (c) Find the determinant $|B| = \det B$ of B .
 - (d) Is B a singular matrix? Give a reason for your answer.
 - (e) Does B have an inverse B^{-1} ? If so, find it. If not, explain why not.
3. If C is an invertible (3×3) -matrix, write down the matrix which is the product of C and its inverse C^{-1} .
4. Consider the matrices $A = \begin{pmatrix} 2 \\ 0 \\ -3 \end{pmatrix}$, $B = \begin{pmatrix} 3 & -3 & 4 \\ 1 & 0 & 2 \end{pmatrix}$, $C = \begin{pmatrix} 3 & -5 & 4 \end{pmatrix}$ and $D = \begin{pmatrix} 2 & -3 \\ -1 & 0 \end{pmatrix}$.
 - (a) Which of the following exist? Where the matrix exists, find it.
 - (i) $A + A$
 - (ii) $A - A$
 - (iii) $B - D$
 - (iv) AA
 - (v) AB
 - (vi) AC
 - (vii) AD
 - (b) What other products (of two matrices) exist among these four matrices? Find all of the others.